Claim Amendments

Please amend claims 1, 13, 16, 17, 19, and 20 as follows:

Please cancel claims 4-6, 8, 9, 11, 12, 14, and 18 as follows:

Please add new claims 21-28 as follows:

Claims as Amended

1. (currently amended) A method for removing particles from a wafer surface comprising damascene openings lined with a metal seed layer comprising the steps of:

providing an ~~electropolishing~~ electrolyte solution comprising said metal;

immersing said wafer surface in said solution in spaced apart relation to an electrode and rotating the wafer in said solution; and

supplying a pulsed electrical current to said wafer and said electrode to result in a net removal of a portion of said metal seed layer prior to electroplating said metal to fill said damascene.

~~imparting a positive electrical charge to the wafer by~~ applying ~~an electrical current to the wafer~~.

2. (currently amended) The method of claim 1 wherein said pulsed ~~electrical current comprises a~~ pulsing electrical current[[,]]

and further comprisesing ~~the step of applying a negative electrical charge to the water in~~ an alternating current to alternately electroplate and remove said metal from said metal seed layer ~~relationship to said positive electrical charge~~.

3. (original) The method of claim 1 further comprising a surfactant in said solution.

4. cancelled

5. cancelled.

6. cancelled.

7. (original) The method of claim 3 wherein said surfactant is a surfactant selected from the group consisting of polyethylene glycol, derivatives of polyethylene glycol, polypropylene glycol, and derivatives of polypropylene glycol.

8. cancelled

9. cancelled.

10. (original) The method of claim 7 wherein said surfactant has a molecular weight of from about 200 to about 50,000.

11. cancelled.

12. cancelled.

13. (currently amended) A method for removing particles from a metal layer on a wafer, comprising the steps of:

providing an ~~electropolishing~~ electrolyte solution comprising ions of said metal;

immersing said wafer in said electrolyte solution and providing rotational friction between the metal layer and said solution by rotating the wafer in said solution; and

applying a pulsed current with alternating polarity between said metal layer and an electrode to alternately electroplate and remove said metal from said metal layer to result in a net removal of said metal layer to form a thinned

metal layer; and ~~removing metal from the metal layer by electrolysis~~

carrying out an electroplating process to form a second metal layer on said thinned metal layer.

14. cancelled

15. (original) The method of claim 13 further comprising a surfactant in said solution, wherein said surfactant is selected from the group consisting of polyethylene glycol, derivatives of polyethylene glycol, polypropylene glycol, and derivatives of polypropylene glycol.

16. (currently amended) The method of claim [[14]] 13 wherein said net removal comprises metal [[is]] removed from the metal layer and said metal [[is]] electroplated onto the metal layer in a ratio of from about 2 to about 5 by weight of said metal.

17. (currently amended) A method for removing particles from a via opening lined by a seed layer on a wafer, comprising the steps of:

providing an ~~electropolishing~~ electrolyte solution comprising copper sulfate, ~~and~~ sulfuric acid, and a surfactant;

providing rotational friction between the seed layer and said solution by rotating the wafer in said solution; and

removing metal from the seed layer by ~~electrolysis~~ applying a pulsed current with alternating polarity between said seed layer and an electrode to alternately electroplate and remove metal from said seed layer to form a thinned seed layer including removing metal particles on said seed layer;

then electroplating copper on said thinned seed layer to fill said via opening.

18. cancelled.

19. (currently amended) The method of claim 17 ~~further comprising a surfactant in said solution,~~ wherein said surfactant is selected from the group consisting of polyethylene glycol, derivatives of polyethylene glycol, polypropylene glycol, and derivatives of polypropylene glycol.

20. (currently amended) The method of claim 18 wherein said metal is removed from the seed layer and said metal is electroplated onto the seed layer in a ratio of from about 2 to about 5 by weight of said metal in the step of removing.

21. (new) The method of claim 1, wherein said net removal is less than about 200 Angstroms.

22. (new) The method of claim 13, wherein said metal layer is thinned by less than about 200 Angstroms.

23. (new) The method of claim 18 wherein a thickness of said metal removed from the seed layer is less than about 200 Angstroms.

24. (new) The method of claim 1, wherein said damascene openings have an opening dimension of less than about 0.2 microns.

25. (new) The method of claim 18 wherein said via opening has an opening dimension of less than about 0.2 microns.

26. (new) The method of claim 1 wherein said metal seed layer is a copper seed layer.

27. (new) The method of claim 13 wherein said metal layer is a copper seed layer lining a damascene opening.

28. (new) The method of claim 18 wherein said seed layer is a copper seed layer.